

SECURE WEBS AND BUYING INTENTION: THE MODERATING ROLE OF USABILITY

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RESUMEN

El presente trabajo ha planteado un modelo conceptual a fin de mostrar como los antecedentes de la intención de compra se ven reforzados en contextos de Webs altamente usables. Específicamente, el trabajo analiza en profundidad el rol moderador de la usabilidad en la explicación de la conexión entre seguridad de una Web e intención de compra. Entre ambos extremos (seguridad e intención de compra), se han incluido diversas variables para explicar mejor su conexión. Para ello, ha sido diseñada una Web ficticia de ropa dirigida al segmento joven de clase media. A fin de alterar la usabilidad de la Web se han realizado dos tipos de manipulaciones: la velocidad y la facilidad de uso de la Web. Las dos Webs creadas (alta usabilidad y baja usabilidad) fueron visitadas por un total de 170 encuestados que fueron compensados con un USB valorado en 15 euros. Los resultados muestran que la seguridad percibida en la Web acarrea tres interesantes efectos (especialmente para la Web altamente usable): (i) mejora las actitudes agrado, (ii) reduce el nivel de riesgo percibido; (iii) aumenta la confianza. Los dos últimos efectos, a su vez, acaban aumentando la intención de compra. Por último, se ha demostrado que la usabilidad, efectivamente, refuerza las relaciones consideradas en el modelo propuesto para explicar la intención de compra.

PALABRAS CLAVE

Usabilidad, seguridad, ropa, diseño Web, intención de compra

ABSTRACT

A conceptual model has been proposed to show how buying intention antecedents are reinforced in highly usable contexts. Specifically, this paper deeply analyses the moderator role of system variables (usability) on explaining the relationship between Web security and buying intention. Between both extremes (security and buying intention), several relationships have also been stated to better explain this effect. An “ideal” fictitious Website was designed for a non existent clothing company directed at the segment of middle class consumers. In order to alter Web usability, two blocks of changes were made, one concerning Website speed and the other related to ease of use. Our experiment sample consisted of 170 respondents who participated in exchange for a pen-drive (USB) valued at 15 euros. The results show that improving website security has three interesting effects (especially in high usable contexts): (i) it improves pleasure attitudes, (ii) reduces the level of perceived risk and (iii) increases trust. Secondly, it has been found that to increase buying intention, two actions must be taken: (i) to diminish perceived risk and (ii) to improve users’ pleasure attitudes towards the Website. Finally, usability has been found to have a moderating role in all the relationships considered (reinforcing them).

KEY WORDS

Usability, security, buying intention, clothing, Website design, buying intention

^{1 1} This paper has been financed by the Project CTIDA 2006/350, Oficina Ciencia y Tecnología (Generalitat Valenciana)

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1. INTRODUCTION

The use of Internet in small companies has received little attention from the literature (Grandon and Pearson, 2004). This is partly due to the fact that the way these companies use Internet is a reflection of the general manager's (usually the owner) personality and desire to innovate (Al-Qirim, 2006). Many studies (Peet, Brindley and Ritchie, 2002), however, show that the use of Internet by SMEs is mostly merely testimonial, with only a few interactive Websites and even fewer offering on line sales. In short, it can be said that traditionally, SMEs use the Web basically to present, advertise and promote company products, rather than to sell them. In contrast, large companies, especially in the financial sector, have already experienced the advantages of the Web as a sales tool.

In this context, it becomes an interesting line of research to improve the results of small companies developing transactional web pages; that is why there are more papers related to e-retailing and e-tail every year. In this field, identifying

applied, the source of data, the experiment preparation and the variables measured. Section 4 presents the results of the analysis. Finally, the main conclusions with their managerial implications and the limitations of the paper are summarized in Section 5 and Section 6 respectively.

2. THEORETICAL FRAMEWORK

2.1.The importance of security

Security refers to perceived sincerity and trust in the service provider (Madu and Madu, 2002). According to Madu and Madu (2002), website security can be appreciated when: the Website has confidentiality policies, not too many questions are asked, confidentiality is explicitly ensured by procedures, rules and/or legal protection of information use, safe technologies are used (not just firewalls), the company is linked to credible, responsible associations, users can chose whether or not to share private information with others and tricks to make users give information or contract services they do not want are avoided, among others. In this sense, several studies have focused on how to achieve secure Websites. An interesting aspect on this point is that security is not only achieved by security certifications and highly restrictive privacy policies, but can also be achieved by manipulating other website variables which *a priori* are not directly linked to security. In short, although the Website may be perfectly secure, if usability is not adequate, users will abandon the site before the desired results are achieved.

2.2.Effects of security: better perceptions, better attitudes and trust.

The relevance of studying the security of a Web is due to four types of effects: (i) on perceptions, (ii) on pleasure attitudes, (iii) on trust; and finally, and as a consequence of all of that, on (iv) consumers buying intentions. Regarding perceptions, several studies support that non security pages will be perceived as riskier pages. Park, Lennon and Stoel (2005) point out that one of the main obstacles to online sales is customer perceived purchase risk. They claim that companies should take particular care when designing their Websites in order to reduce perceived risk and make online shopping a pleasurable experience. More specifically, the authors report a certain relationship between certain Website characteristics (in particular aspects related to website product presentation, such as the use and size of images, interaction, evidence of security) and variables such as perceived risk. Similarly, Wakefield and Whitten (2006) show that Website credibility/security reduces perceived risk for the customer. Therefore, the following hypothesis could be stated:

H1a: As web security increases, perceived risk decreases.

Some authors go even further and point out that this security-risk relationship can be moderated by other variables, for example website usability. On these lines, Cheskin and SA (1999) managed to identify six website characteristics capable of influencing consumer perceptions, linked to the trust provided by the company and by extension, to the levels of risk associated to their website: (1) safeguard assurances, (2) the company's reputation, (3) navigability, (4) robust order compliance, (5) professional Website and (6) advanced Website design technology. For these authors, then, the attributes which help to reduce consumer risk perceptions of a website can be divided into two blocks: those which increase navigation security and those which facilitate navigability. These authors postulate that levels of perceived risk are lowered as security increases and this is enhanced in contexts of ease and speed of navigation. In the same line, Salisbury, Pearson, Pearson and Miller (2001, p.166) state that "there may be a perception or risked involved in transmitting sensitive information such

as credit card number across the World Wide Web. Because of this, we believe that purchasing products over the World Wide Web has aspects consistent with that of risk behaviour". So, risk is associated with lack of security. Even more, "to the extent that outcomes cannot be controlled and occur purely by chance, risk is higher than situations where the adopter can influence outcomes". These favourable situations are characterised by high navigability which increases perceived security and decreases risk perception. In short, a website which is easy and convenient to use, where users can control what they are doing, will be looked on favourably. Thus the website is perceived as being secure and so is perceived positively, with a perception of low risk. The above suggests that if a website is considered secure, levels of perceived risk will diminish and this connection will be further strengthened in high usability contexts. Therefore:

H1b: The influence of security on perceived risk will increase in highly usable contexts (higher security-lower perceived risk).

In terms of attitudes, several studies state that certain security attributes can help to make the Website user's experience more agreeable, so security will be one of the antecedents to pleasure attitudes towards a Website (Aladwani, 2006). In this context, the study by Belanger, Hiller and Smith (2002) focuses on three website attributes and finds interesting connections between them: (i) privacy (statements and seal), (ii) pleasure (e.g. easy to use) and (iii) security. In particular, the authors report that security and privacy bring pleasure as they facilitate website use. In contrast, Lim and Dubansky (2005) found no significant relationship between security and privacy norms and the attitude created by a website. In spite of this, the general opinion supports the idea that a website will cause negative feelings when it is preceded by unsure statements, and, thus, is perceived as a non-quality Website. From this point of view, a website is agreeable and arouses pleasurable feelings if it is able to provide updated information, to identify errors fast and to solve them and to ensure correct operation (Liu and Arnett, 2000), all through different security indicators. That is why increasingly, companies exercise continuous control and update their websites to avoid the perception of abandonment, and transmit a sensation of security to user and by extension, of pleasure towards the company and the website. Therefore:

H2a: As web security increases, pleasure attitudes will increase.

The majority opinion in the literature appears to connect the terms "security" with "pleasure" as the more secure the website, the more pleasurable the attitude towards it. Furthermore, as authors such as Gefen, Karahanna and Straub (2003) point out, website usability will enhance this link as in higher usability contexts there is more interconnection between the different determinants of online purchase (for example, high security and feelings of pleasure). From this perspective the connection between "security" and "pleasure attitudes" will be further reinforced as website usability improves. The reason for this is that websites where navigation is faster, are perceived to be more secure and finally more pleasurable. The connection among these three concepts (security, pleasure and usability) is also highlighted by Belanger, Hiller and Smith (2002). The authors state that certain Website attributes can help to make the Internet user's experience of that Website more pleasant. These authors even classify the attributes which include security, ease of use and the aesthetics of the site, as pleasurable or pleasing. Therefore:

H2b: The influence of security on pleasure attitudes will increase in highly usable contexts (higher usability-better attitudes).

Finally, with respect to trust, Schlosser, White and Lloyd (2006) have developed a model where security elements are expected to affect trust. The relevance of getting trust through security items has been underline also

by Madu and Madu (2002, p.252). The authors explain how “users are often concerned about dealing with virtual organizations that may not have a physical location where they could be tracked. So, is imperative that a virtual operation must build trust by being highly reliable and dependable in the manner it responds to customer inquiries and complains”. In fact, concerns over privacy and security are at the very top of the list for today's potential web buyer” due to their interesting effects (Hopwood, Sinason and Tucker, 2000). So, given that trust is an effect closely associated with security it could be stated that:

H3a: As web security increases, trust will increase.

On these same lines it is stated that customers may quickly lose confidence in a Website that does not work properly, and is not able to maintain privacy and confidentiality (Madu and Madu; 2002, p.252). In other words, if a website has a lot of errors, the content is destructured and it takes a long time to navigate (i.e. weak usability), its associated security will deteriorate and finally lead users to have less trust in the website. In contrast, in positive contexts of high usability websites which function properly, if security increases, confidence improves. Thus, investment allocated to facilitate website navigation will strengthen the sensation of security it transmits which will lead to high levels of trust. Therefore:

H3b: The influence of security on trust will increase in highly usable contexts (higher usability-higher trust).

2.3.Effects of perceived risk: lower attitudes, lower trust and lower buying intention.

Let us now examine the various effects of perceived risk. Firstly, it is well known that perceptions influence attitudes and as perceptions of risk decrease, pleasure increases. Following Salisbury, Pearson, Pearson and Miller (2001, p.165) “perceptions about using the World Wide Web for purchasing products will lead to the formation of attitudes that will influence intent to purchase products on the World Wide Web”. Thus, for example, Shankar, Urban and Sultan (2002) note that as Website risk levels decrease, Internet users feel more favourable towards the site. In the same line, Hoffman, Novak and Chatterjee (1999) point out that consumer’s ability to control the actions of a Web vendor, directly affects perception of security and privacy, key drivers of on line feelings and buying intention. In the same line, Park, Lennon and Stoel (2005) analyse the relationship between perceived risk, emotions and on line shopping and identify high connections between these factors. So, perceived risk mediates the effects of Website and consumer characteristics on final web behaviour (buying intention).

H4a: As perceived risk increases, pleasure attitudes will decrease

In addition, the fact that usability increases, thereby reducing risk perceptions, will reinforce the Internet user’s feelings of pleasure. This reinforced relationship between perceived risk and pleasure attitudes in high usability contexts is noted by Cappel and Huang (2007). These authors underline that Web usability advocates stress the importance of clarity, simplicity, and consistency in Web design so that users can perform desired operations efficiently and effectively. If a Website lacks these characteristics, users may become confused or frustrated, feel no pleasure and “take their business” to competing sites. In the same line, Agarwal and Venkatesh (2002) point out the connexion between no risk-and pleasure attitudes in favourable environments. Specifically, the authors state that usability is associated with many positive outcomes, such as a reduction in the number of errors, enhanced accuracy, more positive attitudes toward the target system, and increased usage given that consumers are not afraid. Also, Lecerof and Paterno (1998) connect the notions of user relevance, efficiency, user attitude, learnability, and no risk. Therefore:

H4b: The influence of perceived risk on pleasure attitudes will increase in highly usable webs (lower perceived risk-better attitudes).

Secondly, perceptions also affect trust levels. In this line, Schlosser, White and Lloyd (2006. p.133) argue that “different Website signals can influence different beliefs about a firm’s trustworthiness, which in turn have differential effects on on line purchase intentions”. Those authors also state that among the real and/or perceived risks are that the firm may overcharge, fail to deliver the product, deliver an inferior product, or fail to protect personal information. To the extent that consumers are concerned about these and other risks of purchasing on line, trusting intentions are affected. The connection between perceived risk and trust is also stated by Aladwani (2006). This author states that Website adoption studies are interested in issues related to how consumers accept a Web (low perceived risk), adopt a Web (high trust) and transact (high buying intention). Therefore:

H5a: As perceived risk increases, trust will decrease

Several authors have studied several determinants of Web trust (Belanger, Hiller y Smith, 2002; Gefen, Karahanna and Straub, 2003), mainly related to security items in highly usable contexts. One of the pioneering works in the literature is Cheskin and SA’s (1999) study. These authors identified six website characteristics capable of influencing consumer perceptions of the risk and confidence provided by the company highlighting in particular “safeguard assurances” and “usability”. Years later, Shankar, Urban and Sultan (2002) concluded that three groups of factors act as antecedents to online confidence: (i) website characteristics such as usability (ii) user characteristics, such as risk perceptions and (iii) other characteristics. In the studies by these authors then, confidence, usability and perceived risk appear to be interconnected. In particular, in high usability websites (where content is organised and easily and quickly accessible), risk perceptions decrease, thereby improving levels of trust in the website. Therefore:

H5b: The influence of perceived risk on trust will increase in highly usable webs (lower perceived risk-better trust).

Finally, perceived risk can affect on line buying intention (Wakefield and Whitten, 2006). Park, Lennon and Stoel (2005) point out that one of the main obstacles to on line sales is determined by perceived purchase risk. They claim that companies should take particular care when designing their Websites in order to reduce the perceived risk and make on line shopping a pleasurable experience. More specifically, the authors find a certain relationship between certain Website characteristics which facilitate navigation and aspects such as emotions, perceived risk and purchase intentions. On the same lines, Wakefield and Whitten (2006) emphasise that companies often use signals to minimise uncertainty associated to market asymmetry, since lower levels of perceived risk are favourable in terms of company results. Thus, the signals emitted to reduce perceived risk become relevant in situations where the consumer is unfamiliar with the products or services, as is commonly found in on line sales. Therefore, a key aspect is to signal the absence of risk since higher levels of perceived risk lead to reduced buying intentions, as consumers consider that they are losing control of the Website (Lim and Dubinsky, 2005). Therefore:

H6a: As perceived risk increases, buying intention will decrease

In the literature there are studies investigating to what extent the connection between perceived risk and buying intention will be reinforced in a higher usability context. According to this approach, a good way of signalling absence of risk would be to set up usable Websites (easy to use and fast) which do not hinder the shopping process. This type of Website extinguishes perceptions of risk and so contributes to greater shopping

intention. Therefore, fast, easy Websites which do not hinder the shopping process reinforce the link between perceived risk and shopping intention (Verhagen and Yao-Hua, 2004). Thus, as a Website improves the way it functions, it will be perceived as less risky than other Websites associated to slow operation, unclear aims and confused content structures and will consequently increase buying intention. Increased buying intention in low perceived risk Websites can be explained by the fact that the Website is relatively simple to use and easy for respondents to understand (Mitchell, 1999).

In short, by constructing increasingly usable Websites, risk perceptions are reduced and this leads to greater buying intentions. In this sense it is worth noting that usability could play a moderator role in the relationship between perceived risk and buying intention.

H6b: The influence of perceived risk on buying intention will increase in highly usable webs (lower perceived risk-higher buying intention).

2.4. Effects of pleasure attitudes: higher buying intention

Attitudes become buying intentions as several authors hypothesise (Schlosser, 2003; Aladwani, 2006). There is, in fact the Theory of Planned Behaviour, which states that “reasoned actions are founded on previous attitudes”, that is, “attitudes can be used to predict behavioural intentions and behaviours” (Salisbury, Pearson, Pearson and Miller, 2001, p.165). In this framework, Agarwal and Venkatesh (2002) underline that affective responses have been shown to play an important role in computer use situations. Specifically, Lim and Dubinsky (2005) point out how some Web characteristics are able to affect consumer’s attitudes and thus reinforce buying intention. In the same line, Ko, Cho and Roberts (2005) also find that positive and significant attitudes to the Website lead to greater buying intentions. So, it can be stated that:

H7a: As pleasure attitudes increase, buying intention will increase

Finally, so far it has been stated that less favourable feelings towards a Website mean fewer purchases from the site whereas positive feelings increase buying intention. However, feelings are closely linked to Website usability, so high usability contexts will reinforce the connection “favourable feelings-purchase” (Cappel and Huang, 2007) since the Internet user is put in a good mood and inspired to shop in fast, accessible environments. From this approach, Belanger, Hiller and Smith (2002) state that Website usability provides greater pleasure and influences buying intention more than other attributes concerning privacy and security. In addition, Schlosser (2003) points out that just as the context can vary in its relevancy to the individual’s goal, the type of site may vary in its relevancy to the individual’s goal. This means that the relationship between attitude (feeling) and buying intention (behaviour) is strongly affected by context. Favourable use contexts (agile, well-organised, easily understandable Websites) will intensify the relationship favourable attitudes-buying intention, while unfavourable use contexts (slow, difficult to understand, messy Websites) will weaken this relationship. In the same line, Ko, Cho and Roberts (2005) find that positive, significant attitudes towards the Website, reinforced through high levels of usability, lead to greater buying intentions. Therefore:

H7b: The influence of pleasure attitudes on buying intentions will increase in highly usable webs (better attitudes-higher buying intention).

2.5. Effects of trust: higher buying intention

As Schlosser, White and Lloyd (2006, p.133) underline, “trust has been largely overlooked in the literature but is key to understanding how on line firms can best convert visitors to buyers”. These authors develop a conceptual framework for understanding how different signals influence the three dimensions of trust (ability,

benevolence, and integrity beliefs) to then justify their influence on on line purchase intentions. That is to explain the connexion between searchers' trusting beliefs and intentions. As Madu and Madu (2002, p.252) explain "trust affects the willingness of users to disclose personal information or to make purchase on line". This thesis has also been tested by several authors who maintain that achieving this confidence will influence consumer behaviour intentions (Harmon and Coney, 1982; Shankar, Urban and Sultan, 2002; Aladwani ,2006; Wakefield and Whitten , 2006). Therefore:

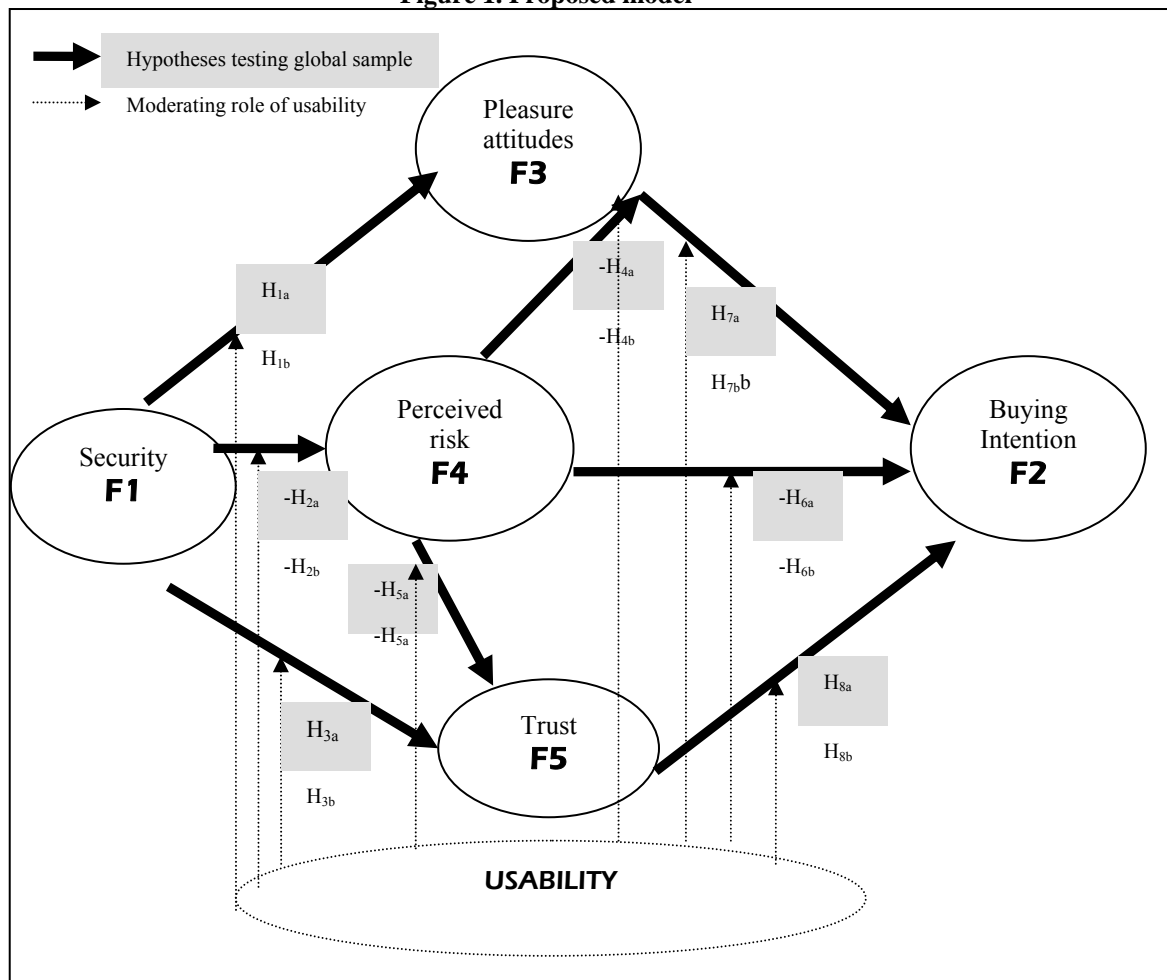
H8a: As trust increases, buying intention will increase.

To summarise then, Shankar, Urban and Sultan (2002) conclude that confidence may have positive effects in both the consumer (action intention, satisfaction and loyalty) and in the company (business results). Some signals (i.e. improving usability) can be used to communicate confidence (Prabhu and Stewart 2001), diminishing final buying intention. That is, the link between confidence in the website and purchase intention can be strengthened if the user is faced with easy to use websites (Aladwani, 2006). Therefore usability has a positive influence on the positive link between both concepts, strengthening the intensity of the relationship.

H8b: The influence of trust on buying intentions will increase in highly usable webs (higher trust-higher buying intention).

Figure 1 is a summary of the hypotheses which will be verified in two different scenarios: a high usability context and a low usability context in order to analyse the moderating role of this variable in the intensity of the proposed relations. Between the point of origin and the final consequence are a set of relationships between different concepts (perceptions, attitudes, confidence, etc.) which will be tested by attempting to analyse the moderator role of usability.

Figure 1. Proposed model



3. METODOLOGY

3.1. Sector selection and experiment planning: a qualitative study

Before defining the experiment and determining the sector to be analysed, 7 focus groups were conducted (n1=6 participants; n2=6 participants; n3=6 participants; n4=6 participants; n5=6 participants; n6=6 participants; n7=8 participants). Following Wong and Sohal (2003), several focus group sessions were held in different contexts in order to guarantee the highest possible participation. Groups 1 and 2 were mainly formed by females over 45 years old, most of them with higher studies. Group 3 was a middle aged (30-45 years old) male group, mainly without higher studies. Group 4 was a younger cluster of participants comprising males and females with higher studies. Group 5 was formed by young females (under 30 years old) with higher studies. Group 6 was a mixed male and female cluster, between 30 and 45 years old, and most of them with university studies. Finally, group 7 was a miscellaneous group both, in terms of gender and in terms of higher studies. All the members in this last group were over 30 years old. After this qualitative study was done, two main conclusions were obtained. Firstly, usability emerged as a key design variable for building successful transactional SME Websites, together with security and product and price information. This result corroborated our decision to work with these variables: security and usability. Secondly, the focus groups showed that clothing is one of the easiest products to sell on line. Compared to traditionally successful articles for on line sales (plane and train tickets, books, CDs and leisure), on line bank, cinema tickets and clothes emerged as three interesting options for on line shopping.

From these two conclusions, this present study was carried out manipulating the usability variable in the textile sector. The sector has been under growing pressure for decades, especially from Asia which is forcing small and medium-sized textile companies offering design, brand and label to seek alternatives which allow North American and European companies to recover lost competitiveness.

3.2.-Fictitious Web design.

As stated before, we chose to manipulate the usability variable in a Website in the textile sector. An “ideal” fictitious Website was designed for a non existent clothing company directed at the segment of middle class consumers. The Website was produced by two graphic designers and the content structured in 6 sections shown horizontally on a menu bar which appeared on all the pages. These sections were prepared ad hoc for the experiment. There was also a fictitious logo in red and black designed by the graphic designers. This logo also appeared on several of the Website pages. Chill out style music was included as being appropriate to the target. The Verisign and Visa logos appeared top right on all the pages to maintain Website security conditions. The shopping form the user was requested to complete also included these logos and other measures to guarantee secure shopping. This experiment was prepared based on Kantner and Rosenbaum’s (1997) revision, who observed that one of the most frequently used methods to study usability impacts was that related to laboratory testing. Through this method real users are required as subjects because they are able to provided detailed insight into specific problems and issues that users face while interacting with the target Website

3.3.Experiment design

In order to alter Web usability, two blocks of changes were made, one concerning Website speed and the other related to ease of use. Firstly, to alter the speed of the Web, the number of clicks was enlarged from “4” in the highly usable page to “9” in the low usable page. In the second scene, consumers couldn’t make the purchase

quickly with minimum pages in the check out processes as Cox and Dale (2002) recommend. Secondly, to alter Web ease of use two measures were adopted. On one side, in the main page the navigation bar menus were moved from the top to the bottom left-hand side. This decision is based on Spool, Scanlan, Schoroeder, Snyder and De Angels (1999), recommendation of horizontal navigation bars to improve usability. The designers were asked to make the menu bar L-shaped (in two parts) and only on the main page. Thus, the left-hand side of the main page contained the links “company”, “catalogue” and “contact” and at the bottom of the page were the links “customer services”, “work with us” and “on line shopping”. It was necessary to move the mouse to visualise the links at the bottom of the page. On another side, in the rest of the pages it was decided to eliminate the navigation menu, leaving only the Resaka logo and a home/start button to return to the main page. This second measure is also based on Spool, Scanlan, Schoroeder, Snyder and De Angels, (1999), who state that users navigating sites with a site map on each page were twice as successful in finding what they wanted compared to those sites without them. As a result of both manipulations (related to speed and related to easy of use), a high and a low usable Website were obtained. The high usable Website was the ideal Web, and the low usable Website was the manipulated Web.

3.4.Sample

Several studies have been done through experimentation in order to better explain buying intention. For example, the paper from Schlosser, White and Lloyd (2006), recently published in the Journal of Marketing, develops an experiment based on 79 undergraduate students to study the moderating effect of security on buying intention. To test this, the sample is exposed to different Webs with different security items. Based on this previous work, our experiment sample consisted of 170 respondents who participated in exchange for a pen-drive (USB) valued at 15 euros. They were recruited in two different underground stations. They were invited to participate in the experiment. If they accepted, they were taken to an office with a specially prepared room so they could navigate around the fictitious Website of an invented company Resaka. The total sample was 57% female and 43% male; 40% had three-year university studies and 48% had secondary studies. More than 50% of the interviewees said they earned more than 2000 euros a month. The age range varied between 18 and 35 years. Of the total sample, 110 interviewees were exposed to the ideal Website, designed following the literature recommendations on usability, while the other 60 were exposed to the Website manipulated for low usability. They were all told that they had a fictitious cheque for 200 euros which they could spend shopping on the Website. After 30 minutes they were given a questionnaire to provide their impressions after navigation.

3.5.Measurement Scales

To measure the different concepts in the model, several scales were used based on proposals in the literature.

3.5.1.Security. To measure usability the 3 items based on Rodgers, Negash and Suk (2005) proposal were used. This is a short, but a effective scale.

3.5.2.Buying intentio. The literature review by Lee and Lin (2005) suggests that buying intention provides a fairly acceptable approach to on line shopping behaviour. For that reason many studies use buying intention as an indicator of Website success. According to Blackwell, Miniard and Engel (2001), buying intention represents what we think we will buy. So, to construct “buying intention scale” 4 items were selected. The first 3 items have already been used by Belanger, Hiller and Smith (2002) and the final item comes from Lee and Lin’s

(2005) proposal. These authors used the items shown in the table, following Gefen (2000) and Jeong, Oh and Gregorio's (2003) scales respectively.

3.5.3. Perceived Risk. To measure perceived risk, 4 items were chosen following the proposal by Wakefield and Whitten (2006) based on the previous work of Jarvenpaa, Tractinsky and Vitale (2000). The items of this scale are able to measure the two types of risk predominately associated with Internet shopping. These risks are product category risk and financial risk. Product category risk is the risk associated with the product itself and it represents the consumers' belief that the product will function according to their expectations. Financial risk refers to the risk associated with the Internet as a purchasing medium (Peszynski and Thanasankit, (2002).

3.5.4. Pleasure Attitude. To measure pleasure attitude towards the site, six items were used following Ko, Cho and Roberts (2005). This scale was based on Chen and Wells (1999), given that traditional brand attitudes cannot be extended to the virtual medium. This scale includes items related to positive feelings, future intentions and satisfaction.

3.5.6. Trust. To measure on line trust, 4 items were included based on Wakefield and Whitten's (2006) proposal, founded also on Larzelere and Huston (1980). As Schlosser, White and Lloyd (2006) sum up, although various trusting beliefs have been studied in the literature, the majority can be conceptually clustered into three dimensions (ability, benevolence, and integrity), that are represented through these four items.

3.6. Statistical techniques

As in Schlosser, White and Lloyd (2006), two models were proposed and compared. In the work by these authors, the two studied models are related to high and low security conditions and the comparison between them are with respect to the β coefficients of a Hierarchical Regression Analysis and of a Stepwise Regression Analysis. In the present paper EQS was used to compare two alternative virtual contexts: highly usable Web and low usable Web.

4. RESULTS

Before verifying the proposed model, the psychometric properties of the measurement model were evaluated.

A confirmatory factor analysis was made of the four measurement scales being studied (navigability, on line buying intention, attitudes towards the Website and perceived risk) using the robust maximum likelihood method. Firstly, the items with factors below 0.6 were eliminated (item P1.4), to ensure that each factor was well-represented, contributing to the model's convergent validity (Bagozzi and Yi, 1998). Additionally, it was verified that all factor loads were significant ($t > 2.56$). Secondly, analysis of the goodness of fit indexes in Table 1 shows that they are around the optimum value of 0.9 (Levy and Varela, 2003). Lastly, average error between the observed matrix and the reproduced matrix is in the range (0.061-0.075) recommended by Bollen (1989). Everything therefore suggests that model fit is appropriate and that it has convergent validity. Compound reliability index values are over the values of 0.7 recommended by Fornell and Larcker (1981) and average variance extracted is over the 0.5 recommended by the same authors. To demonstrate discriminant validity, we proceeded to identify problematic factors by covariance analysis of the four factors being studied. It can be seen that between F5 (trust) and F3 (pleasure attitudes) the correlation is a little bit high (0.672). This could indicate a

problem of discriminant validity, although calculation of confidence intervals following Anderson and Gerbing (1988) showed that this interval did not include the value 1 in this or any other case (Table 2).

Table 1

Psychometric properties of the measurement instrument: reliability and convergent validity

<i>Latent Variable</i>	<i>Indicator</i>	<i>Standardized Charge</i>	<i>T value</i>	<i>Composite Reliability Index</i>	<i>AVE</i>	<i>Reliability</i>
F4 Security	P1.1	0.600	6.772	0.721819	0.5	<ul style="list-style-type: none">• Alpha=0.9• Rho=0.9• Bentler’s coefic.=0.9
	P1.2	0.700	8.016			
	P1.3	0.768	8.598			
F3 Buying Intention	P2.1	Eliminated		0.839321	0.6	
	P2.2	0.883	13.729			
	P2.3	0.804	12.108			
	P2.4	0.867	13.425			
F2 Pleasure Attitudes	P3.1	0.619	8.653	0.901567	0.5	
	P3.2	0.846	13.359			
	P3.3	0.907	14.956			
	P3.4	0.840	13.217			
	P3.5	0.729	10.725			
	P3.6	0.694	10.036			
F1 Perceived Risk	P4.1	Eliminated		0.855282	0.7	
	P4.2	0.793	11.474			
	P4.3	0.860	12.701			
	P4.4	0.789	11.393			
F5 Trust	P5.1	Eliminated		0.865963	0.7	
	P5.2	0.768	11.138			
	P5.3	0.904	13.782			
	P5.4	0.803	11.787			
Chi-square(135g.l.)=481.933; p<0.01; BBNFI=0.75; BBNFI=0.8; CFI=0.8; RMSEA=0.12						

(*) Chi-square/g.l.=2.3<5

Table 2

Psychometric properties of the measurement instrument: discriminant validity

	F1	F2	F3	F4	F5
F1	1	.586 (0.442; .718)	.506 (0.354; 0.646)	-.282 (-0.458; -0.102)	.499 (0.338; 0.642)
F2		1	.715 (0.618; 0.802)	-.308ns (-0.462; -0.138)	.468 (0.318; 0.602)
F3			1	-.202 (-0.366; -0.034)	.672 (0.566; 0.774)
F4				1	-.146ns (-0.314; -0.034)
					1

Above the diagonal: estimated interfactor correlation. Under the diagonal: confidence interval for interfactor correlation **= $P < 0.01$, *= $p < 0.05$; ns

After evaluating the psychometric properties of the measurement instrument, the structural model shown in Figure 1 was estimated considering the total sample object of the study, i.e. the 170 interviewees. This shows that of the 8 relationships postulated, 5 are significant and 3 are not. As Table 3 shows H_{1a} , H_{2a} , H_{3a} , H_{6a} and H_{7a} can be accepted and H_{4a} , H_{5a} and H_{8a} rejected.

The accepted hypotheses refer to the effects of website security and the antecedents to online purchase intention. This corroborates that website security provokes the three types of postulated effects: (i) improved feelings of pleasure (H_{1a}); decrease in levels of perceived risk (H_{2a}) and (iii) improved confidence towards a website (H_{2a}). It has also been corroborated that purchase intention is caused by two variables: 8i) low levels of perceived risk (H_{6a}) and (ii) high pleasure sentiments (H_{7a}). That is, there will be more purchases from websites where less risk is perceived and which are liked more. In contrast, it has not been corroborated that perceived risk affects feelings of pleasure (H_{4a}), or levels of trust (H_{6a}). That is, although a website may have a low level of perceived risk, that does not mean users will like it or that it will generate trust. Nor is it confirmed that trust affects purchase intention (H_{8a}). In other words, websites which generate greater trust, will not be those which generate greater purchase intention. Table 3 shows which hypotheses have been accepted or rejected.

Tabla 3
Model testing

	<i>Standardized Charge</i>	<i>T value</i>	<i>Hypothesis</i>
H_{1a} : More security, higher pleasure attitudes (+)	+ 0.1	4.638	Accepted
H_{2a} : More security, less perceived risk (-)	-0.9	-2.688	Accepted
H_{3a} : More security, higher trust (+)	+ 0.2	4.860	Accepted
H_{4a} : More perceived risk, less pleasure attitudes (-)	Not significant	Not significant	Rejected
H_{5a} : More perceived risk, less trust (-)	Not significant	Not significant	Rejected
H_{6a} : More perceived risk, less buying intention (-)	- 0.2	-2.539	Accepted
H_{7a} : More pleasure attitudes, higher buying intention (+)	0.80	7.024	Accepted
H_{8a} : More trust affects, higher buying intention (+)	Not significant	Not significant.	Rejected
Chi-square(247g.l.)=292.836; $p<0.01$; BBNFI=0.9; BBNFI=0.9; CFI=0.9 RMSEA=0.08			

** 5% significant

Then, the moderating role of usability in the relationships postulated in hypotheses, was analysed with two independent estimations, one for Internet users who were exposed to the ideal Web and another for Internet users who were exposed to the Web manipulated to substantially worsen navigability. All the hypotheses were tested again using multisample analysis with EQS software (version 5.7b). According to Jaccard and Wan (1996), 2 steps are needed. The first does not involve any formal analysis of the moderating effect, as for each group of interviewees (high usability and low usability), the parameters and significance of each of the proposed causal hypotheses are estimated. As Table 4 shows, R^2 is between 0.6 and 0.7 in both contexts (high and low usability). The model is therefore able to explain on line shopping intention in both scenarios. This multi-sample analysis shows that, as obtained in the general case, five hypotheses can be accepted (H_{1a} , H_{2a} , H_{3a} , H_{6a} and H_{7a}) and three rejected (H_{4a} , H_{5a} and H_{8a}). In other words, the results obtained generally for the whole sample are repeated in each subsample (high usability and low usability). Table 4 shows the results. It can be seen that the strongest relationship (0.9) is the one linking website security to feelings of pleasure (H_{1a}) and trust (H_{3a}).

Table 4
Multisampling analysis: comparison for two usability contexts

HIGH USABILITY	STANDARDIZED COEF.	T-VALUE	HYPOTHESIS
H_{1a} : More security, higher pleasure attitudes (+)	0.9	4.683*	Accepted
H_{2a} : More security, less perceived risk (-)	-0.3	-2.688*	Accepted
H_{3a} : More security, higher trust (+)	0.9	4.860*	Accepted

H _{4a} : More perceived risk ,less pleasure attitudes (-)	Not significant	Not signif.	Rejected
H _{5a} : More perceived risk, less trust (-)	Not significant	Not signif.	Rejected
H _{6a} : More perceived risk, less buying intention (-)	-0.2	-2.542*	Accepted
H _{7a} : More pleasure attitudes ,higher buying intention (+)	0.7	6.742*	Accepted
H _{8a} : More trust affects, higher buying intention (+)	Not significant	Not signif.	Rejected
LOW USABILITY	STANDARDISE D COEFF.	T- VALUE	HYPTOT HESIS
H _{1a} : More security, higher pleasure attitudes (+)	0.7	4.305	Accepted
H _{2a} : More security, less perceived risk (-)	-0.4	-3.083	Accepted
H _{3a} : More security, higher trust (+)	0.8	4.401	Accepted
H _{4a} : More perceived risk ,less pleasure attitudes (-)	Not signif.	Not signif.	Rejected
H _{5a} : More perceived risk, less trust (-)	Not signif.	Not signif.	Rejected
H _{6a} : More perceived risk, less buying intention (-)	-0.18	1.830	Accepted
H _{7a} : More pleasure attitudes ,higher buying intention (+)	0.66	6.432	Accepted
H _{8a} : More trust affects, higher buying intention (+)	Not signif.	Not signif.	Rejected
Chi-square(262.)= 433.847; BBNFI=0.9 BBNNFI=0.9 CFI=0.9 RMSEA=0.062			

** 5% significant

Secondly, the Lagrange multiplier test (Imtest) shows significant differences between the parameters in both subsamples. Thus, we can verify whether elimination of the restrictions produces a significant change in the X^2 statistic, which would lead to rejection of the equality restriction in the parameters as its elimination would significantly improve model fit. The statistic associated to the X^2 difference for each of the restrictions separately indicates that all the proposed relations are verified. Therefore, it can be stated that website usability significantly influences the different relations considered. The results show that the different hypothesised relations are weakened in low usability website scenarios. Firstly, there is a weakening of the impact of security on feelings of pleasure (H_{1b}), perceived risk (H_{2b}) and trust (H_{3b}). Secondly, there is a weakening of the effect of decreased perceived risk on feelings of pleasure (H_{4b}) and trust (H_{5b}). Finally, low website usability will also attenuate the effect of perceived risk (H_{6b}), pleasure attitudes H_{7b}) and trust (H_{8b}) on purchase intention. In contrast in high usability contexts all the relationships are strengthened and so the moderator role of usability would be accepted in all cases (Table 5). Figure 3 shows the hypothesis verification in graph form.

Table 5
Hypothesis verification: the moderating role of usability

CONSTRAINTS	X^2 differences	p-value	HYPÓTHESIS
H _{1b} : Usability moderates the positive effect of security on pleasure attitudes (+)	7.132	0.008**	Accepted
H _{2b} : Usability moderates the negative effect of security on perceived risk (-)	13.275	0.001**	Accepted
H _{3b} : Usability moderates the positive effect of security on trust (+)	14.233	0.003**	Accepted
H _{4b} : Usability moderates the negative effect of perceived risk on pleasure attitudes (-)	15.259	0.004**	Accepted
H _{5b} : Usability moderates the negative effect of perceived risk on trust (-)	16.294	0.006**	Accepted
H _{6b} : Usability moderates the negative effect of perceived risk on buying intention (-)	17.246	0.008**	Accepted
H _{7b} : : Usability moderates the positive effect of pleasure attitudes on buying intention (+)	17.810	0.013**	Accepted

H _{8b} : Usability moderates the positive effect of trust attitudes on buying intention (+)	17.877	0.022**	Accepted
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** 5% significant

5. CONCLUSIONS

The results show that attracting certain visitors to a website may bring commercial benefits to small companies if they manage to change surfers into buyers. Consequently, this study has focused on identifying the variables which can increase purchase intention. In general, we can point to four major conclusions:

Firstly, it has been shown that improving website security has three interesting effects: (i) improving pleasure attitudes (H_{1a}), so that users feel happier, (ii) reducing the level of perceived risk (H_{3a}), so that the surfer is less afraid; (iii) and in relation to the latter, trust levels are increased (H_{2a}), so that the surfer becomes friendlier and more familiar with the website. The issue of website security should therefore be a priority, in view of these three interesting effects.

Secondly, it has been found that to increase purchase intention, two actions with direct repercussions on this variable must be taken; (i) decrease perceived risk (H_{6a}) and (ii) improve the surfer's pleasure attitudes towards the website (H_{6a}). That is, the risk perceptions associated to a website and the attitudes the site awakens determine purchase intention on the website. Traditionally, it has been argued that online purchase was perceived as a entailing some risk, thus limiting this type of purchase. However, our results show that in addition to perceived risk, other variables such as pleasure attitudes towards the website, also affect purchase intention. However, no significant link between perceived risk and pleasure attitudes (H_{4a}). has been found. Likewise the decrease in perceived risk does not improve levels of trust and familiarity with the website (H_{5a}). That is, the same surfer can experience opposing feelings, as despite the perceived risk, there can also be feelings of pleasure and trust in the website. This may be due to the fact that perceived risk is intrinsic to surfing and buying online and difficult to eradicate.

Thirdly, no direct relation between trust in a website and purchase intention has been found, so websites which awaken most familiarity are not websites where there is a tendency to buy more (H_{8a}). This may be explained because our experiment has been carried out on a new website, with an invented brand, unknown to the consumer. The results may be different in the context of well-known, familiar brands.

Fourthly, usability has a clearly moderating role, since all the relationships considered, significant or otherwise are strengthened in contexts of high usability. Usability is therefore a key variable in transactional website design.

6. MANAGERIAL IMPLICATIONS AND LIMITATIONS

The above conclusions lead us to consider the following managerial implications. Firstly, small companies should make an effort to construct secure websites which can: (i) reduce perceived risk, (ii) improve pleasure, (iii) increase trust and finally (iv) stimulate online sales.

Secondly, website usability has proved to be an essential variable in strengthening online purchase intention. Easy to use, fast websites will strengthen the different antecedents of online purchase. Therefore in a scenario of scarce resources, small and medium-sized companies should prioritise the concept of usability when designing transactional websites, as the determinants of online purchase are strengthened in highly usable websites.

Thirdly, it would be interesting to improve pleasure attitude towards a Website to reinforce online buying intention. As has been shown, this improvement in attitude is not necessarily linked to a reduction in perceived risk. Therefore, it would not be sufficient to introduce appropriate security measures, strict approval procedures or reliable guarantee systems, an improved attitude towards the Website must be achieved by other means. In this sense, favourable attitudes towards a Website can be achieved, in addition to usability, through other variables such as: (i) the information provided, which must be quality information (e.g. zoom options, the chance to change the colour of the objects to be purchased, variety of sizes, promotions and offers section etc.); (ii) web design should be appropriate to the Website target (e.g. pleasant colours, tonal combinations which attract navigation, the type of music which is fashionable in the target public); (iii) purchase facilities (e.g. the possibility of exchanging goods, home delivery etc.); (iv) customer service (e.g. complaints and suggestions box, customer club, interactivity, etc.).

Fourthly, although investment in usability has been shown to be more appropriate than investment aimed at reducing perceived risk in terms of improving pleasure attitudes and enhancing their effect on on line shopping intention, this should be understood in the framework of the sector analysed and the type of companies considered. Therefore in limited budget scenarios, in mature industries such as the sector analysed here, where companies are competitive and fragmented into many small and medium-sized companies, the results show that usability should be paramount over security. In other environments, the managerial implications may be different.

In view of the above, possible future lines of research would be to extend this study to other less mature and traditional sectors, related for example to the new technologies in order to provide cross-industry studies and also in other countries to provide cross-cultural studies. The ideal Website could also be manipulated in other ways,

for example to worsen security or information content in order to replicate the proposed model and analyse the moderating role of variables other than usability (e.g. security, information content, e-service etc).

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